

# 2004

New Hampshire Estuaries Project



## Data Management Plan

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## Introduction

A goal of the New Hampshire Estuaries Project (NHEP) and its monitoring program is to promote a cooperative effort by all agencies and organizations who participate in monitoring activities, in order to maximize the usefulness of current monitoring efforts and available data. To achieve this goal, it is necessary to effectively manage the large volume of existing information as well as new information that will be developed through the NHEP monitoring program.

Data and information about NH's estuaries now exists in multiple formats within a variety of organizations. Existing monitoring programs are designed to meet the missions of the various implementing organizations. The organizations use different procedures and protocols for data collection, analysis, storage, and reporting. Coordination of data management among organizations is currently limited.

This Data Management Plan contains protocols for data reporting to the NHEP to facilitate data integration. Different protocols will be applied to different types of data (e.g., chemical, geospatial, and biological). The protocols will be considered contract requirements for NHEP monitoring programs and recommended guidelines for other partners.

## Protocols for Data Reports to the NHEP

### Chemical

For all data on chemical concentrations in water, sediment, soil, and tissue, the NHEP's goal is to integrate the data into a centralized database at the NH Department of Environmental Services. The NHDES Environmental Measurement Database contains all NHDES data plus data from Great Bay Coast Watch and a growing list of other NH monitoring organizations. This database is accessible via the internet at <http://www.des.state.nh.us/OneStop/>. The NHEP believes that compiling data in the Environmental Measurement Database will save NHEP staff time for State of the Estuaries reports and will make the data accessible to other researchers.

**Georeferencing** For each station in the datatable, the following information should be provided at a minimum:

1. A unique "StationID", which is an alphanumeric combination of 15 or less characters
2. The station type (Estuary, River, Lake, Pipe, etc.).
3. The latitude and longitude of the station (DD MM SS format).
4. The town in which the station is located.
5. The method used to determine the latitude and longitude (dGPS, GPS, map interpolation, etc.).

6. The datum used to determine the latitude and longitude (NAD27, NAD83, etc.)

The station information form provided in Appendix A can (but does not have to) be used to report this and additional information about the station.

These station details are not needed for long-term Great Bay National Estuarine Research Reserve (GBNERR) monitoring stations in Great Bay and the Piscataqua River. However, the following station naming convention from the GBNERR program should be used.

<u>Location</u>	<u>StationID</u>
Adams Point	GRBAP
Chapman's Landing	GRBCL
Squamscott RR Bridge Sonde	GRBSQ
Lamprey River Sonde	GRBLR
Oyster River Sonde	GRBOR
Central Great Bay Sonde	GRBGB
Coastal Marine Lab Pier	GRBCML

## Format

Data should be provided in Microsoft Excel spreadsheets or comma delimited text files. Data for the concentrations of chemicals in water, sediment, or soil should be in a format compatible with the DES Environmental Measurement Database. This database uses a "one result per row" format. Therefore, the spreadsheets should have the following columns at a minimum. An example table is provided in Appendix B.

Column Name	Description
StationID	Station identifier
Category	The category of the activity (routine, replicate, etc.).
Medium	Sample medium (e.g., water, sediment, soil)
Date	Date the activity began, usually the date the sample was taken.
Time	Time the activity began, usually the time the sample was taken.
Personnel	Person(s) conducting the activity.
Depth	Depth to activity.
DepthUnits	Units for depth to activity.
Parameter	Name of parameter that was analyzed (e.g., Dissolved Oxygen)
ResultNumeric	Numeric results for the parameter.
ResultQualifier	Qualifier for the results (example: <, >, >= , ND, U, J, etc.)
Units	Units for the results.

Content	Data provided to the NHEP should have undergone quality assurance checks by the principal investigator and be considered final. Data that do not meet data quality objectives from quality assurance project plans or standard operating procedures should be excluded from the dataset. Field duplicate samples should be included in the dataset but laboratory duplicates should not.
Documentation (metadata)	All laboratory results should be accompanied by the name of the laboratory and the analytical method used. The analytical methods should be a reference to a Standard Methods number, an EPA method number, or some other citation. A quality assurance project plan or standard operating procedure can be provided to supply this information. If the laboratory or the method for a parameter is not the same for the whole dataset, then the metadata should make it clear which laboratory and method was used for each result.

### Geospatial

The NH Estuaries Project requests that all contractors engaged in geospatial data development activities conform to a set of basic standards governing data structure, format, and documentation. These standards, defined by NH GRANIT, will ensure that all data may be utilized by GIS users in the state and the region.

For further information about GRANIT, the statewide GIS clearinghouse, please see [www.granit.sr.unh.edu](http://www.granit.sr.unh.edu).

Georeferencing	All data should be referenced to New Hampshire State Plane feet, North American Datum (NAD) 83.
Format	<p>The preferred formats for data submission are those directly readable by ESRI software, including shapefiles (*.shp), export files (*.e00), and geodatabases (*.mdb). Other acceptable formats include Autocad drawing files (*.dwg), Autocad exchange files (*.dxf), and Microstation design files (*.dgn).</p> <p>If you are unable to provide data in any of the above, please email the GRANIT database manager (<a href="mailto:granit.sr.unh.edu">granit.sr.unh.edu</a>) to inquire about other options.</p>
Content	Please ensure the spatial integrity of all vector polygon data, including closure of all polygons, absence of sliver

polygons, absence of dangling arcs, etc.

Documentation  
(metadata)

Each data set must be accompanied by a comprehensive metadata record that conforms to the Federal Geographic Data Committee (FGDC) "Content Standard for Digital Geospatial Metadata" (FGDC-STD-001-1998), June, 1998. For further information on this standard, see [www.fgdc.gov/metadata/metadata.html](http://www.fgdc.gov/metadata/metadata.html)

Many software packages provide tools for the development of FGDC-compliant records. If you do not have access to an appropriate tool, or would like to see an example of a completed metadata record, please email the GRANIT database manager ([granit.sr.unh.edu](mailto:granit.sr.unh.edu)) for assistance.

Biological

NHEP uses a variety of biological data to calculate environmental indicators for State of the Estuaries reports. For example, shellfish standing stock estimates are calculated from oyster and clam quadrat density data. Biological data will not be compiled in a centralized database because the datasets are often so different.

Georeferencing

For each station in the datatable, the following information should be provided at a minimum:

1. A unique "StationID", which is an alphanumeric combination of 15 or less characters.
2. The station type (Estuary, River, Lake, Pipe, etc.).
3. The latitude and longitude of the station (DD MM SS format).
4. The town in which the station is located.
5. The method used to determine the latitude and longitude (dGPS, GPS, map interpolation, etc.).
6. The datum used to determine the latitude and longitude (NAD27, NAD83, etc.)

The station information form provided in Appendix A can (but does not have to) be used to report this and additional information about the station.

These station details are not needed for data that are reported for major features such as the Nannie Island oyster bed or the Middle Ground clam flat. Instead, these data can just be reported for the name of the feature.

Format	Data should be provided in Microsoft Excel spreadsheets or comma delimited text files.
Content	Data provided to the NHEP should have undergone quality assurance checks by the principal investigator and be considered final. Data that do not meet data quality objectives from quality assurance project plans or standard operating procedures should be excluded from the dataset.
Documentation (metadata)	All results should be accompanied by either a quality assurance project plan or a standard operating procedure that document the methods used to generate the data.

## **Appendices**

Appendix A: Sampling Station Identification Form

Appendix B: Example Table

# Sampling Station Identification Form

Note: Shaded items are ultimately required.

Form Completed By:

Project Station ID (15 char max) Alias ID Station Name

Transect Town (no village names) State (circle one) Date Established

NH ME  
MA VT  
Canada

Station Type (circle one)

Air - Ambient	Culvert	Landfill	Soil Boring	Wetland - Estuarine, emergent
Air - Indoor	Drain Manhole	Land Runoff	Spring	Wetland - Estuarine, forested
Canal - Drainage	Estuary	Mine/Mine Discharge	Storm Sewer	Wetland - Estuarine, scrub-shrub
Canal - Irrigation	Facility - Industrial	Ocean	Tidal Swale	Wetland - Lacustrine, emergent
Canal - Transport	Facility - Municipal Sewage (POTW)	Pipe	Waste Pit	Wetland - Palustrine, emergent
Catch Basin	Facility - Other/combined	Reservoir	Waste Sewer	Wetland - Palustrine, forested
Channelized Stream	Facility - Privately owned non-industrial	River/Stream	Well	Wetland - Palustrine, moss-lichen
Combined Sewer	Lake	Riverine Impoundment		Wetland - Palustrine, scrub - shrub
Constructed Wetland	Land	Seep		Wetland - Riverine, emergent

Waterbody Name

Designated River Reach (list on other side)

Related Lake

Final Discharge Location (Used by Watershed Assistance)

Total Station Water Depth

Units  
(Circle one)  
in/ft/  
cm/m

Station Description:

Directions to Station:

Date Located: \_\_\_\_/\_\_\_\_/\_\_\_\_

If located by GPS:

Latitude (Ex:DD MM SS.SS)

Longitude

GPS File Name

GPS Unit/Serial #  
(list on other side)

Corrected?

Yes No

Locational comments:

If located by other method:

Method of Location (circle or enter):

Interpolation - Map Land-Survey  
Interpolation - Photo  
Interpolation - Satellite  
Other: \_\_\_\_\_

Map Scale (circle or enter)

1:24,000/25,000  
1:100,000  
Other: \_\_\_\_\_

Datum (circle or enter)

NAD 1927  
NAD 1983  
WGS 1984  
Other: \_\_\_\_\_

Elevation Information:

Elevation

Units

ft/m

Method (Circle one)

Map Interpolation Digital (DEMs)  
Differential Mode GPS  
Absolute Mode GPS  
Conventional Survey  
Public Land Survey  
Altimeter

Datum (circle or enter)

NGVDD 1929  
NAVD 1988  
WGS 1984  
Local Tidal Datum  
Mean Sea Level  
Other: \_\_\_\_\_

Site Diagram (or attach map with location marked)

**Designated River Segments:**

Ashuelot  
Cold  
Connecticut  
Contoocook/North Branch  
Exeter  
Isinglass  
Lamprey  
Lower Merrimack  
Pemigewassat  
Piscataquog  
Saco  
Souhegan  
Swift  
Upper Merrimack

**GPS Units:**

<u>Make</u>	<u>Model</u>	<u>Serial#</u>	<u>Section</u>
Garmin	GPS III	40157743	Biomonitoring
Garmin	GPS III Plus	92186038	Watershed Assistance
Garmin	GPS III Plus	92177955	Water Quality
Magellan	320	23857	Shellfish
Trimble	GeoExplorer II	0010004LQ8	Biology
Trimble	GeoExplorer II	0010004LQ2	Biology
Trimble	GeoExplorer III	23970	Watershed Assistance
Trimble	ProXL	3450A00313	Data Management



**APPENDIX B: EXAMPLE TABLE FORMAT FOR DATA REPORTS TO THE NH ESTUARIES PROJECT**

StationID	Category	Medium	Date	Time	Personnel	Depth	DepthUnits	Parameter	ResultQualifier	ResultNumeric	Units
ME02-0260A	ROUTINE	WATER	7/22/2002	13:15	J. DOE	0.5	M	DISSOLVED OXYGEN		7.6	MG/L
ME02-0260A	ROUTINE	WATER	7/22/2002	13:15	J. DOE	0.5	M	ENTEROCOCCUS		65.5	#/100ML
ME02-0260A	ROUTINE	WATER	7/22/2002	13:15	J. DOE	0.5	M	ESCHERICHIA COLI		9.5	#/100ml
ME02-0260A	ROUTINE	WATER	7/22/2002	13:15	J. DOE	0.5	M	NITROGEN, AMMONIA AS N		0.018	mg/L
ME02-0260A	ROUTINE	WATER	7/22/2002	13:15	J. DOE	0.5	M	NITROGEN, NITRATE (NO3) + NITRITE (NO2) AS N		0.031	mg/L
ME02-0260A	ROUTINE	WATER	7/22/2002	13:15	J. DOE	0.5	M	NITROGEN, NITRATE (NO3) AS N		0.031	mg/L
ME02-0260A	ROUTINE	WATER	7/22/2002	13:15	J. DOE	0.5	M	NITROGEN, NITRITE (NO2) AS N	<	0.001	mg/L
ME02-0260A	ROUTINE	WATER	7/22/2002	13:15	J. DOE	0.5	M	PH		8	UNITS
ME02-0260A	ROUTINE	WATER	7/22/2002	13:15	J. DOE	0.5	M	PHOSPHORUS, ORTHOPHOSPHATE AS P		0.016	mg/L
ME02-0260A	ROUTINE	WATER	7/22/2002	13:15	J. DOE	0.5	M	SALINITY		29.7	PPT
ME02-0260A	ROUTINE	WATER	7/22/2002	13:15	J. DOE	0.5	M	SILICATE		0.276	mg/L
ME02-0260A	ROUTINE	WATER	7/22/2002	13:15	J. DOE	0.5	M	SOLIDS, TOTAL SUSPENDED (TSS)		7.5	mg/L
ME02-0260A	ROUTINE	WATER	7/22/2002	13:15	J. DOE	0.5	M	TEMPERATURE WATER		20	DEGC
ME02-0260A	ROUTINE	WATER	7/22/2002	13:15	J. DOE	0.5	M	TOTAL FECAL COLIFORM		12	#/100ml